ABSTRAK

PENENTUAN TITIK SERAP DAN ESTIMASI REMAINING RESERVES DALAM PENGEMBANGAN LAPANGAN "FRN"

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Lapangan FRN merupakan lapangan offshore di Cekungan Jawa Timurlaut dengan reservoir pada Formasi Ngimbang Karbonat dan OOIP sebesar 36.6 MMSTB. Lapangan ini telah berproduksi sejak Desember 2010 dan mengalami penurunan produksi yang signifikan, ditandai dengan meningkatnya *water cut* hingga 95% pada akhir periode produksi. Nilai *Recovery Factor* (RF) pada kondisi basecase yang hanya sebesar 2.66% mengindikasikan masih terdapat potensi cadangan hidrokarbon yang signifikan untuk dioptimalkan melalui penambahan sumur infill. Penelitian ini bertujuan untuk merencanakan lokasi sumur infill, menentukan laju alir produksi awal (Qoi), serta mengevaluasi performa produksi dan cadangan dari skenario pengembangan yang dilakukan.

Penentuan titik lokasi sumur infill dilakukan dengan analisis peta persebaran porositas dan *Hydrocarbon Pore Volume* (HCPV) *overlay* dengan *bubblemap* radius pengurasan dan *cumulative oil* menggunakan *Oilfield Manager Software*. Laju produksi alir awal (Qoi) ditentukan dengan menggunakan pendekatan *Productivity Index* (PI) dengan sumur analog berdasarkan tren penurunan tekanan reservoir (*pressure decline*). Peramalan produksi skenario dilakukan menggunakan metode *Decline Curve Analysis* (DCA).

Hasil penelitian menghasilkan 4 titik lokasi sumur infill yang seluruhnya berada di luar radius pengurasan sumur *existing*. Sumur Infill-01 pada koordinat X: 383404.19 dan Y: 9244891.74, Infill-02 pada X: 384021.71 dan Y: 9245184.22, Infill-03 pada X: 383031.84 dan Y: 9244794.37, serta Infill-04 pada X: 384460.03 dan Y: 9246072.70. Qoi Infill-01 dan Infill-03 diperoleh sebesar 459.99 BOPD, sedangkan Qoi Infill-02 dan Infill-04 sebesar 703 BOPD. Skenario *basecase* + 4 *infill* menghasilkan EUR sebesar 2255.35 Mbbl, *Remaining Reserves* sebesar 1437.22 Mbbl, dan RF sebesar 6.16%, meningkat 3.50% dibandingkan kondisi *basecase*, sehingga penambahan 4 sumur infill dinilai layak untuk mengoptimalkan perolehan hidrokarbon Lapangan FRN.

Kata kunci: *Decline Curve Analysis*, *Estimated Ultimated Recovery* (EUR) *Recovery Factor*, *Remaining Reserves* dan Sumur *infill*

ABSTRACT

DETERMINATION OF DRAINAGE POINTS AND ESTIMATION OF REMAINING RESERVES IN THE DEVELOPMENT OF "FRN" FIELD

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FRN Field is an offshore field located in the Northeast Java Basin with a reservoir in the Ngimbang Carbonate Formation and an OOIP of 36.6 MMSTB. The field has been producing since December 2010 and has experienced a significant production decline, marked by increasing water cut up to 95% at the end of the production period. The Recovery Factor (RF) under basecase conditions of only 2.66% indicates that there is still significant hydrocarbon reserve potential to be optimized through infill well addition. This study aims to plan infill well locations, determine the initial production rate (Qoi), and evaluate the production performance and reserves of the proposed development scenario.

Infill well location determination was carried out through overlay analysis of porosity and HCPV distribution maps with drainage radius and oil cumulative bubble maps using OFM software. Qoi determination was performed using an analog well approach based on pressure decline data and Productivity Index (PI) calculations. Production forecasting was conducted using the exponential Decline Curve Analysis (DCA) method with an economic limit of 10 BOPD.

The study resulted in 4 recommended infill well locations, all of which are outside the drainage radius of existing wells. Infill-01 is located at coordinates X: 383404.19 and Y: 9244891.74, Infill-02 at X: 384021.71 and Y: 9245184.22, Infill-03 at X: 383031.84 and Y: 9244794.37, and Infill-04 at X: 384460.03 and Y: 9246072.70. The Qoi for Infill-01 and Infill-03 was obtained at 459.99 BOPD, while Infill-02 and Infill-04 at 703 BOPD. The basecase + 4 infill scenario yielded an EUR of 2255.35 Mbbl, Remaining Reserves of 1437.22 Mbbl, and an RF of 6.16%, an increase of 3.50% compared to the basecase condition, indicating that the addition of 4 infill wells is feasible to optimize hydrocarbon recovery in FRN Field.

Keywords: Decline Curve Analysis, Estimate Ultimate Recovery (EUR, Recovery Factor, Remaining Reserves and Infill Well